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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,659	10/29/2001	Dave Good	1-22813	9889

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MACMILLAN SOBANSKI & TODD, LLC
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EXAMINER

KERNS, KEVIN P

ART UNIT PAPER NUMBER

1725

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,659

Applicant(s)

GOOD ET AL.

Examiner

Kevin P. Kerns

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-14 is/are rejected.
- 7) ☒ Claim(s) 11 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/29/01 and 5/13/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 11 and 14 are objected to because of the following informalities: in the 1st line of claim 11, the claim dependency should be changed from (cancelled) claim 1 to claim 10. In the 1st line of claim 14, the claim dependency should be changed from (cancelled) claim 6 to claim 13. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishida et al. (US 4,741,381).

Nishida et al. disclose a method and apparatus for controlling pressure from a compressed air/nitrogen/argon source 1 in a holding furnace 7 (casting chamber) in a low pressure die-casting system, in which a tube 8 (evacuation conduit) from the furnace is in fluid communication with the mold cavity 9 (abstract; column 1, lines 9-16; column 2, lines 47-56; column 6, lines 41-43; and Figures 1-3). The apparatus includes at least one pressure sensor 13,18 (transducer) and a microcomputer 10 (controller) that controls a desired pressurization pattern (changeable pressure upon addition of gas

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to control flow of molten metal M) as a function of time (abstract; column 1, lines 61-68; column 2, lines 1-25 and 56-68; column 3, lines 1-44; column 4, lines 5-56; column 6, lines 41-44; and Figures 1-5). The pressurization pattern of Figure 4 shows a series of inflection points (effecting pressure/filling rate changes of molten metal M), such that the time interval before point J has a higher gas pressure, and thus a higher filling rate, than the time interval between point J and point J+1 (column 5, lines 32-68; column 6, lines 1-33; and Figure 4).

Furthermore, Figure 4 graphically presents that there are four filling stages associated with four corresponding time (t) intervals and four corresponding pressure (P) change intervals, with the four stages being defined as follows: 1) stage 1 being between 0 (the graph origin) and point J; 2) stage 2 being between J and J+1; 3) stage 3 being between J+1 and J+2; and 4) stage 4 being between J+2 and J+3 (column 5, lines 32-68; column 6, lines 1-33; and Figure 4).

As shown in Figure 4, the steeper slope corresponds to a faster mold filling rate, such that the following desired pressurization pattern is obtained, and thus corresponds to process steps (b)-(e) of claim 10, steps (c)-(f) of claim 12, and step (e) of claim 13:

1) the profile of stage 1 results from accelerating molten metal via supplying gas to obtain a desired fill rate and an actual fill profile between origin 0 and point J; 2) the profile of stage 2 results from slowing the fill rate from the end of stage 1 to the beginning of stage 2 at a smooth, uninterrupted transition point J to obtain a desired fill rate and an actual fill profile between points J and J+1; 3) the profile of stage 3 results from increasing the fill rate in a manner similar to the profile of stage 1, from the end of

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stage 2 to the beginning of stage 3 at transition point J+1 to obtain a desired fill rate and an actual fill profile between points J+1 and J+2; and 4) the profile of stage 4 results from slowing the fill rate in a manner similar to the profile of stage 2, from the end of stage 3 to the beginning of stage 4 at transition point J+2 to obtain a desired fill rate and an actual fill profile between points J+2 and J+3 (column 5, lines 32-68; column 6, lines 1-33; and Figure 4).

4. Claims 10-14 are rejected under 35 U.S.C. 102(b) as being anticipated by the applicants' admitted prior art (specification; and Figures 1 and 3).

The applicants' admitted prior art discloses a conventional countergravity casting apparatus with the following structures that are common to those disclosed in the (prior art) Kuhn et al. reference (US 5,215,141): a mold 12, a supply conduit 76 connecting the mold 12 to a crucible furnace 14 (casting chamber), a gas supply port 64 (inert gas source 60 in Kuhn et al.), a pressure transducer 52 (104 in Kuhn et al.) to produce a pressure signal, a pressure controller 54 (98 in Kuhn et al.) operative to regulate the pressure and obtain a desired fill profile, and a supply of molten metal 16 to be pressurized to fill the mold 12 (specification; page 1, lines 12-24; page 5, lines 8-10; page 15, lines 8-9; and Figure 1). As shown in Figure 3 (prior art desired fill profile 112), the rate of pressure increase (and hence the filling rate), is reduced in the time interval spanning t1 and t2, as opposed to the time interval between t0 and t1, in which the 2nd filling rate decelerates and thus does not exceed the 1st filling rate (specification; page 10, 3rd line through page 15, 9th line; and Figure 3).

Furthermore, Prior Art Figure 3 graphically presents that there are four filling stages associated with four corresponding time (t) intervals and four corresponding pressure (P) change intervals, with the four stages being defined as follows: 1) stage 1 being between P0 and P1 (t0 and t1); 2) stage 2 being between P1 and P2 (t1 and t2); 3) stage 3 being between P2 and P3 (t2 and t3); and 4) stage 4 being between P3 and P4 (t3 and t4) (specification; page 10, 3rd line through page 15, 9th line; and Figure 3).

As shown in Figure 3, the steeper slope corresponds to a faster mold filling rate, such that the following desired pressurization pattern is obtained, and thus corresponds to process steps (b)-(e) of claim 10, steps (c)-(f) of claim 12, and step (e) of claim 13:

1) the profile of stage 1 results from accelerating molten metal via supplying gas to obtain a desired fill rate and an actual fill profile between point (t0,P0) and point (t1,P1); 2) the profile of stage 2 results from slowing the fill rate from the end of stage 1 to the beginning of stage 2 at a smooth, uninterrupted transition point (t1,P1) to obtain a desired fill rate and an actual fill profile between points (t1,P1) and (t2,P2); 3) the profile of stage 3 results from increasing the fill rate in a manner similar to the profile of stage 1, from the end of stage 2 to the beginning of stage 3 at transition point (t2,P2) to obtain a desired fill rate and an actual fill profile between points (t2,P2) and (t3,P3); and 4) the profile of stage 4 results from slowing the fill rate in a manner similar to the profile of stage 2, from the end of stage 3 to the beginning of stage 4 at transition point (t3,P3) to obtain a desired fill rate and an actual fill profile between points (t3,P3) and (t4,P4) (specification; page 10, 3rd line through page 15, 9th line; and Figure 3).

Response to Arguments

5. The examiner acknowledges the applicants' amendment/remarks provided with the request for continued examination, received by the USPTO on October 17, 2003. The applicants had previously cancelled non-elected claims 3, 5, and 9 in the amendment (paper #5) received by the USPTO on May 13, 2003. In addition, the present applicants' amendment cancels claims 1, 2, 4, and 6-8. As a result, all original claims 1-9 are now cancelled. New claims 10-14 are presented and are now under consideration in the current applicants' amendment.

6. Applicants' arguments with respect to claims 10-14 have been considered but are moot in view of the new ground(s) of rejection (see further details in above paragraphs 3 and 4).

The applicants' new claims 10-14 overcome the prior 35 USC 102(b) rejections under Balevski et al. and Matsubayashi et al., as these references lack the required four filling stages set forth in independent claims 10, 12, and 13. However, Nishida et al. and the applicants' admitted prior art individually disclose four filling stages along with all pertinent claim limitations, as set forth in detail in above paragraphs 3 and 4.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (703)

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305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Kevin P. Kerns *Kevin Kerns 12/3/03*
Examiner
Art Unit 1725

kpk
December 3, 2003